Fermi National Accelerator Laboratory

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DECnet DLM Circuit Plans*

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INTRODUCTION

There is a need to define how we should manage X.25 DLM circuits for DECnet as we migrate to our X.25 based backbone. The implementation of this new backbone is still being defined, so this note is not intended to serve as a migration plan to the backbone, but to assist in understanding how we might establish the matrix of DLM circuits for DECnet to minimize the routing overhead. There are three basic issues to address. First the DLM circuits for the network backbone and CERN. Second, DLM circuits from end-nodes (Universities) to Laboratories and other end-nodes. And finally, circuit costing of the network to allow for effective circuit pathing.

PROPOSED NETWORK BACKBONE DLM CIRCUITS

The purpose of having multiple DLM circuits between major HEP sites is to perform the DECnet routing at the X.25 level by creating virtual circuits directly between the major HEPnet sites. In the first case we need to have single DLM circuits between DECnet areas of interest. This means we should have DLM circuits between areas 41, 42, 43, and 22. (See figure 1.0) Multiple DLM circuits between areas must be carefully controlled to avoid area segmentation and to control the determination of traffic flow. The exception to this is a DLM circuit between MIT and CERN which would exist (at a higher circuit cost) as a back-up for the satellite circuit between Fermilab and CERN. (The proper costing of this line is shown in figure 2.0) In this most simple implementation, the maximum number of DLM circuits at any one node is four at Fermilab. The loss of a DLM circuit will be replaced by normal DECnet routing on the backbone and communications will continue normally.

X.25 UTILIZATION OFF OF THE BACKBONE AT UNIVERSITIES

We absolutely need to define a policy for DLM circuits. We cannot allow Universities to create DLM circuits at their whim. **As a default, we will need to limit the typical University to a single DLM circuit established to the site where their leased line terminates.** They must also have a node assignment within that same area as their leased line (as is required now for DECnet). We would however, encourage PSI X.29 calls using "SET HOST/DTE=nnn" directly to the host of interest. This will be the most efficient and responsive way to create a terminal session to a host on the X.25 network. In the case of the major laboratories with data PBX switches, calls

would be made directly to them. This of course assumes that PAD's will be installed in these switches at the various laboratories.

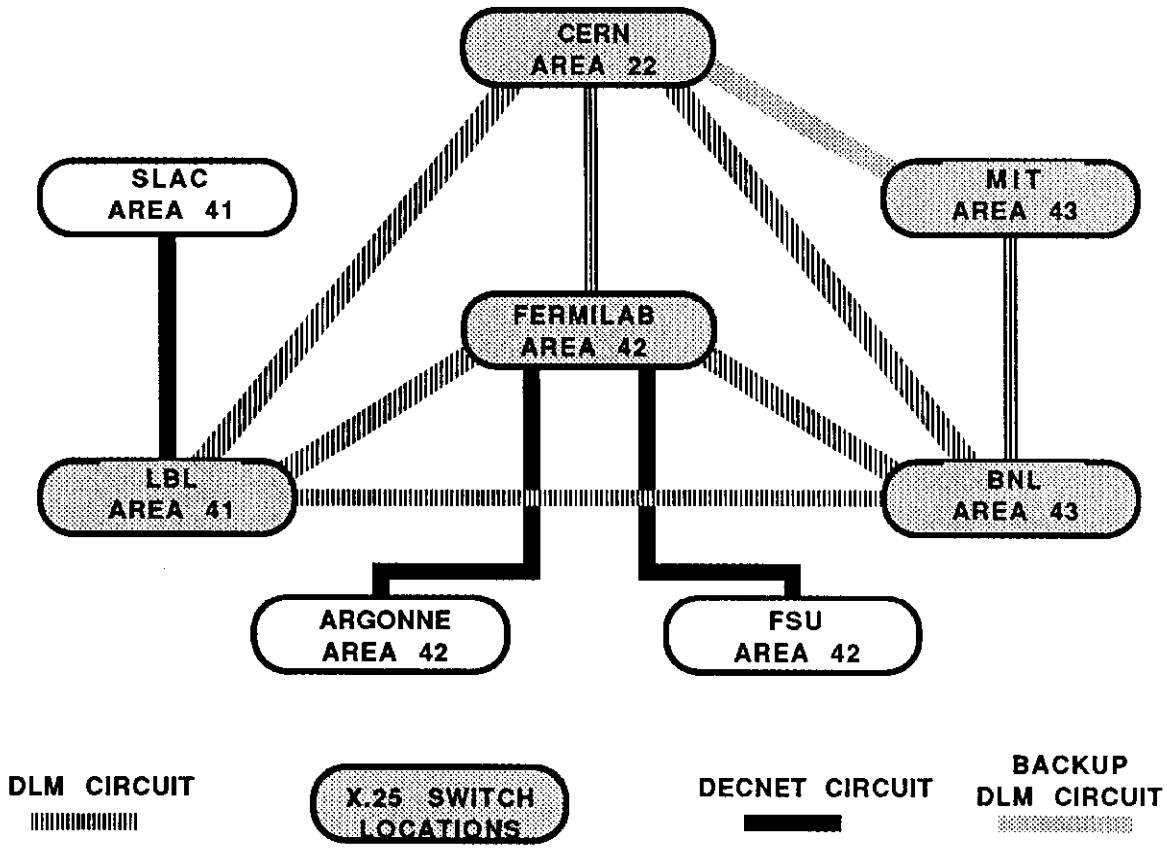

Figure 1.0

There may be a method by which we could make exceptions to the University created DLM circuits. The means by which this could be allowed exists as an untested theory and involves the use of the "area filtering scheme" we currently are using. I would hope that we would not have to use this scheme because it would place restrictions upon the local configurations of routers at the laboratories and would further complicate an already too complicated situation. It would be much cleaner if we were to insist upon control of University generated DLM circuits.

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CONFIGURATION OF INITIAL DLM IMPLEMENTATION

The initial configuration as shown in figure 1.0 assumes several parameters which might be different from our actual implementation. For example, it is assumed that FSU would initially be running DECnet over DDCMP. FSU however has PSI running and may option to have a DLM circuit. There is also an assumption that MIT will have a switch available at the time of implementation. The MIT switch may not arrive in time to be implemented as shown. The timing of installation in general is unknown at this time. Our configuration may require several severe distortions to accommodate installation.

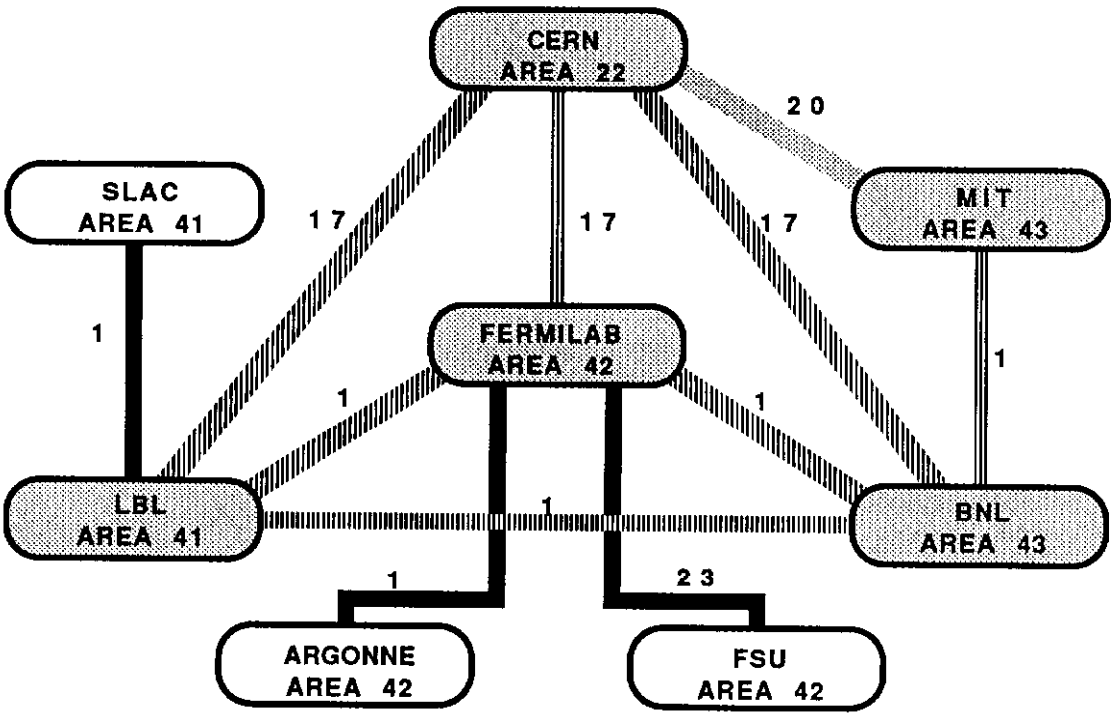

Figure 2.0

DLM CIRCUIT COSTING

The circuit costing for the DLM circuits does not require any deviation from the circuit costing plan which we have adopted for our use. The addition of DLM circuits on the backbone creates some "virtual" redundancy in links. Routing of data at the X.25 level removes the DECnet routers from being the single point of failure of our network and moves it to the X.25 switches. An

examination of the West Coast area configuration may be in order when SLAC obtains an X.25 switch. It would be extremely desirable to have SLAC and BNL in separate areas at that time. We anticipated this when we assigned area numbers a few years ago so splitting the two labs into separate areas would not create any additional problems. I would not consider removal of the existing leased lines between LBL - SLAC - Fermilab and LBL. Initially we may wish to increase the cost of these lines (to two or three) as they currently exist as DDCMP DECnet links and install the X.25 lines with a cost of one as is shown in figure 2.0. this would allow us to test the X.25 implementation and move it in-and-out of production as we see fit.

CONCLUSION

The issues of DLM circuits and circuit costing are manageable if we impose a few limitations on their creation. Our actual implementation will probably deviate from this most ideal proposal. I hope this note will provide a reasonable starting point for us to use.